

UCAR CARBON

ON THE COVER:

The quality is in
the employee ...
Machinist
Henry Beard
checks a graphite
connecting pin
at our plant in
Columbia, Tenn.
Each employee is
responsible for
helping ensure
that we continue
to produce the
highest quality
manufactured
carbon and
graphite products
in the world.

Dollar amounts in millions	1989	1988	Percent Change
For the year			
Net sales ^a	\$ 802	\$ 726	+ 10
Operating profit	44	46	- 4
Net income	17	17	—
Capital expenditures	47	44	+ 7
Return on capital ^b	6.0%	6.5%	

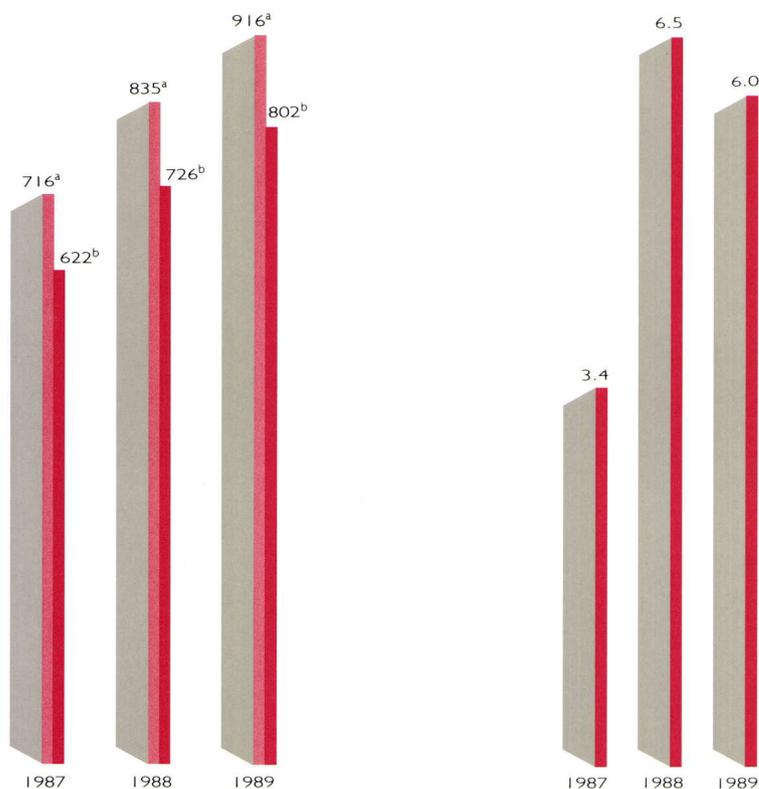
At year-end

Total assets	\$ 815	\$ 814	—
Total debt	266	280	- 5
Net assets	320	291	+ 10
Total capital	636	636	—
Debt/capital ratio	41.8%	44.0%	
Number of employees	6,024	6,482	- 7

a Includes \$20 million sales to affiliates in 1989 and \$3 million in 1988.

b After-tax operating profit divided by total capital. Total capital consists of net assets, total debt and minority stockholders' equity in combined entities.

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SALES

(MILLIONS OF DOLLARS)

a Sales including operations carried at equity
b Net sales of combined operations

RETURN ON CAPITAL

(IN PERCENT)

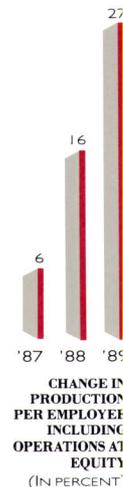


Results in 1989 demonstrated that UCAR Carbon can operate profitably in one of the most competitive segments of basic industry. Our 1989 sales performance in both dollars and volume rose to levels we haven't seen since the heady days of the 1970's, reaching nearly \$1 billion when combined with all affiliates. Higher raw material costs kept operating profit of \$44 million about even with 1988's improved results.

Although market conditions prevented us from passing most of the higher costs on to our customers, the decline in prices stabilized for the first time since 1981 as demand stayed level and carbon manufacturers around the world closed down obsolete high-cost facilities. Our industry has experienced a long and painful period of overcapacity, but we're now encouraged by the apparent trend toward a more balanced supply/demand situation.

UCAR Carbon's business success hinges on our reputation for quality. Our philosophy of Total Quality permeates the entire organization and is supported by continuous measuring and testing procedures at every phase of our operations. As a result, we have increased productivity and reduced waste. The accompanying chart shows the dramatic increase in our productivity since the end of 1986, as measured by the percentage change in production per employee.

We are clearly the world's leading supplier of carbon and graphite products, with over 66% of sales, including operations at equity, made outside the United States. Our geographic positioning is the best in the industry, with 13 major facilities in nine countries around the world serving all major markets, including North and South America, Eastern



and Western Europe, South Africa and the Soviet Union. Our six European plants ensure our participation in the integrated European Market scheduled for inauguration in 1992.

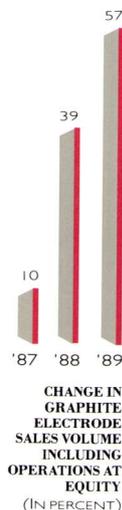
Over the years we have significantly improved the quality of our graphite electrodes used in electric furnace steelmaking—the expanding segment of the steel industry. Indeed, our development of ultra-high power graphite electrodes has been a major factor in the growth of the electric furnace steel industry.

We are determined that our company will again become a significant contributor to corporate earnings. We understand our market, we know our strengths and needs, and we're willing to make the necessary and sometimes difficult changes that will help us achieve our earnings goals.

Because rising power and transportation costs made our plant in Puerto Rico uncompetitive, we gradually reduced production there during 1989, finally closing it completely in January 1990. This shutdown, coupled with full production at our modern facility at Clarksville, Tenn., will contribute significantly to cost-reduction efforts in 1990.

At the same time, we have simplified our management structure, reducing administrative procedures and staff. We are challenging every employee not only to welcome change but to create it. The results have been greater productivity, higher-quality products and better service to customers.

The improvements paid off last year in a number of coveted quality awards from major customers. Our people manufacture and market the highest-quality carbon and graphite in the world, and we are especially pleased to be recognized by customers, the people who count the most.



Quality is important, of course, but so is our ability to increase the usefulness of carbon and graphite to our customers. That's where our leadership in graphite technology pays off. Scientists, engineers and technicians at our Technical Center in Parma, Ohio, work with our worldwide field service people to improve our carbon and graphite products, to find new or more efficient uses for them and to create new ideas, new applications and new products.

In a project completed in 1989, a team of Parma scientists investigated new processes involved in treating our basic raw materials. In just two years—from conception to commercialization—they significantly reduced raw material costs for our graphite electrodes and saved millions of dollars. It's no wonder that a number of our scientists have international reputations and have won major honors. Last year, for just one example, Senior Corporate Fellow Irwin Lewis received the American Carbon Society's prestigious Pettinos Award for basic research in the science and technology of carbon.

UCAR Carbon is a lean and productive organization reaching every global market via very short reporting lines. Our ability to make the best products at the lowest cost, with superior technology and the flexibility of manufacturing sites around the world, makes us a formidable competitor in the carbon industry.

Robert P. Krass
President

February 28, 1990

U CAR Carbon produces more graphite electrodes than any other company in the world—electrodes unsurpassed in quality. While conducting immense amounts of electricity into the white-hot heart of electric steelmaking furnaces, they hold their strength and shock resistance at temperatures as high as 5000°F.

Although earnings of UCAR Carbon's graphite electrode group, our largest-volume product, underperformed our other product groups, particularly in the United States, worldwide sales of electrodes rose 9% in 1989, reaching their highest volume since 1981. Operating profit in 1989 increased 17%, the result of cost-containment programs at our facilities on four continents.

Because more than 75% of the company's sales, including operations at equity, are from graphite electrodes, UCAR Carbon is truly committed to the electric arc furnace method of steelmaking. In 1987, we introduced the first in a new line of value-added products for the arc furnace industry. Capitalizing on our well established worldwide marketing and technical presence in the steel industry, we developed and are marketing water-cooled arc furnace component parts using patented UCAR spray-cooled technology. This unique cooling system for arc furnaces is more efficient, more productive and safer than any other on the market today. Currently, there are systems operating in Japan, Taiwan, Greece, Belgium, West Germany, Canada and Mexico in addition to the United States.



AN OPERATOR IN COLUMBIA, TENN., GUIDES A CRANE MOVING GRAPHITE ELECTRODES TO COOLING AREA.

Our technical knowledge of arc furnace operations has also led us to develop an arc furnace process control and monitoring system that provides more accurate and meaningful information to the steelmaker. Several prototype systems have been in operation for a year now with excellent results. We will begin to realize the benefits from full commercialization in 1990.

Electric arc furnace melting is the method of choice for new steelmaking capacity in practically every country where steel is produced. As a result, demand for electrodes can be expected to match the industry's growth pattern of about 2% yearly, which is twice the rate of total steel production.

Rising power and transportation costs forced us to close our plant in Puerto Rico early in 1990. In 1989, we put our newest facility, the

most efficient electrode plant in the world, into full operation at Clarksville, Tenn.

We are determined to maintain our lead in the electrode business and have committed tens of millions of dollars each year to improving our facilities. We have installed a number of advanced production devices and systems and have also computerized many aspects of our development and manufacturing technology. Robots are now handling products in some areas of our plants, and sophisticated statistical controls monitor and measure our production. With these and many other methods, we are continuously improving the quality of our electrodes. In addition, the resulting reduction of costly waste has produced shorter, more reliable cycle times that require smaller raw material inventories compared with just a few years ago.

CONTINUOUS
MEASURING AND
STATISTICAL
CONTROLS AT EVERY
PHASE OF ELECTRODE
PRODUCTION ENSURE
CONSISTENT HIGH
QUALITY.



Modern electrode production really began when we first developed the longitudinal graphitization process, which has been adopted throughout the industry. We've been improving the process ever since. We have introduced an automated, environmentally clean system for impregnating graphite with pitches that change and improve the properties of finished electrodes. Our computer-controlled baking furnaces make electrodes that perform to the same high standards every time. For customers, consistent quality and performance is a plus that pays real dividends.

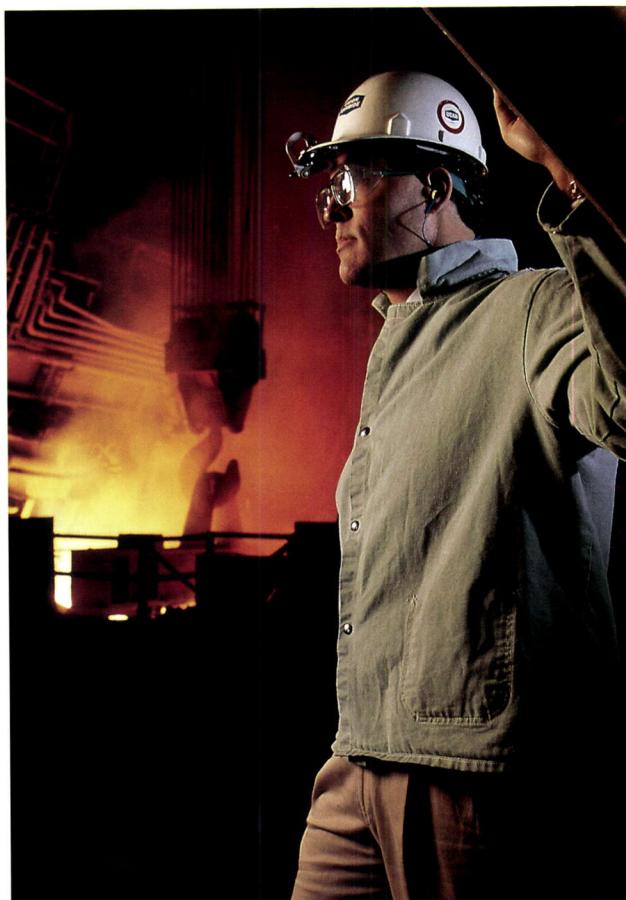
GRAPHITE SPECIALTY PRODUCTS

Our graphite specialty business supplies molded and extruded graphite products to the electrochemical, chemical, smelting, nuclear and

other industries worldwide. Specialty graphite is used for the metals industry, for glassmaking, for casting steel railcar wheels, for lining industrial furnaces and for nuclear power plants. Customers who require machined parts can get high-quality, precision machining from our Clarksburg, W.Va., facility, the world's largest graphite machine shop. We also market graphite blanks to customers for machining in their own plants.

Compared with 1988, our basic core products in graphite specialties generated higher earnings in 1989. This was a result of our making changes in our product mix, re-pricing our products and implementing major process improvements at the Clarksburg plant as well as our plant near Albertville, France. We look for additional savings in 1990 from quality improvement programs

A UCAR CARBON
SALES
REPRESENTATIVE
MONITORS
ELECTRODE
PERFORMANCE IN
A CUSTOMER'S
ELECTRIC ARC
FURNACE.



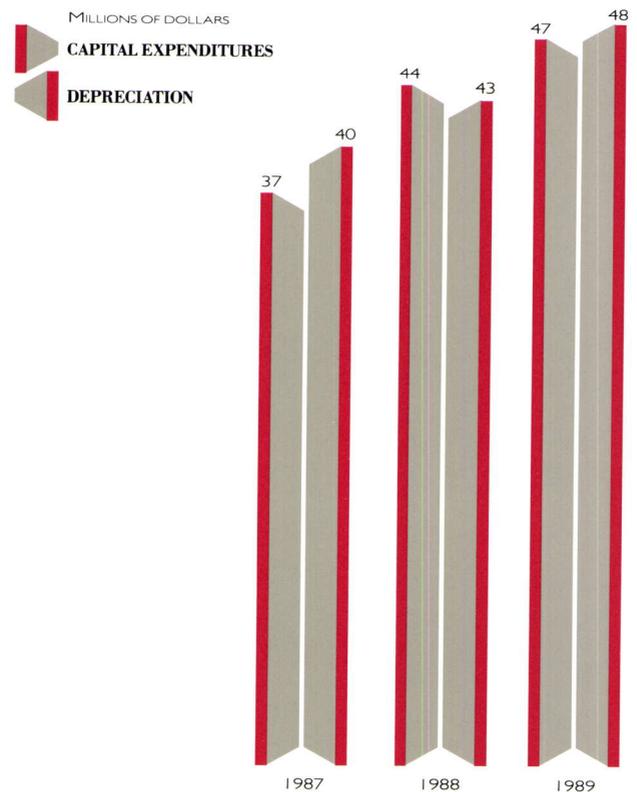
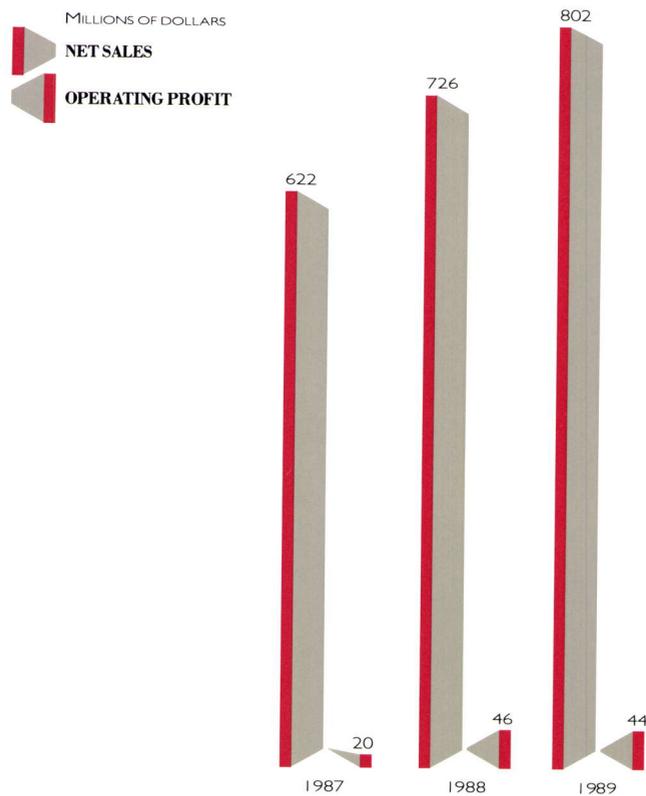
already in effect. We are concentrating on improving the market share of those products that return the highest value and rationalizing those product lines that don't. Most of our products can be manufactured at any one of our four graphite specialties facilities around the world giving us unmatched flexibility to meet the needs of our global markets.

We expect the graphite specialty core business to remain relatively stable. While business levels in Europe remained high in 1989, fourth-quarter U.S. sales slowed, and it appears that customers are taking a cautious approach to the balance of 1990. We are adjusting production schedules and inventories accordingly.

We will continue development work on new carbon and graphite materials and applications. But

whether through research, acquisitions or various contractual arrangements with other producers, our business will focus increasingly on value-added products and systems that extend graphite's immense range of properties and applications. We are positioned to support leading-edge companies as well as to help customers in traditional industries to modernize. An example of this strategy can be found in tooling systems for the aerospace and defense industries. In 1988, we established Coast Composites, Inc. to fashion precise GRAPHI-TOOL graphite tools to be used as molds for composite parts in advanced aircraft, submarines and deep-space antennae dishes.

UCAR Carbon's graphite specialty business is conducted from nine countries around the world, providing us with market access unmatched by our



competitors. As a result, we are close to our customers. We know their needs and how to meet them.

GRAFOIL FLEXIBLE GRAPHITE

GRAFOIL flexible graphite bends and conforms to surfaces it is pressed against, forming a tight, chemical-resistant bond. It is used by the automotive, chemical, refining and power industries as a facing material for gaskets and seals. GRAFOIL flexible graphite begins as natural graphite. UCAR Carbon treats the graphite with chemicals and heat, and then rolls it into sheet form. The GRAFOIL sheets go to local fabricators, who manufacture them into finished products.

In 1989, manifold gaskets and head gaskets for the automotive industry accounted for 65 % of

sales. Sales were strong in the beginning of the year, but slowed when car sales slumped. As a result, total sales in 1989 were relatively flat compared with 1988. Longer-term growth prospects, however, remain strong. Product sales increased 250 % in the last five years and are expected to double over the next five years.

As manufacturers in the chemical and petroleum processing industries continue to phase out asbestos gaskets, sales of GRAFOIL flexible graphite have increased significantly. As more replacement programs are undertaken throughout these and other industries, GRAFOIL applications will grow substantially.

Product and process improvements during 1989 reduced manufacturing costs while improving service and quality. Because of the inno-

UCAR CARBON'S
STRATEGY: TO REMAIN
THE HIGH-QUALITY,
COST LEADER IN
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REGIONS RECEIVING
EXPORTS.



vative efforts of UCAR Carbon's work force, production capacities for GRAFOIL flexible graphite have more than doubled over the past two years, with very little capital expenditure required. The group also received preferred supplier awards from two major customers in 1989.

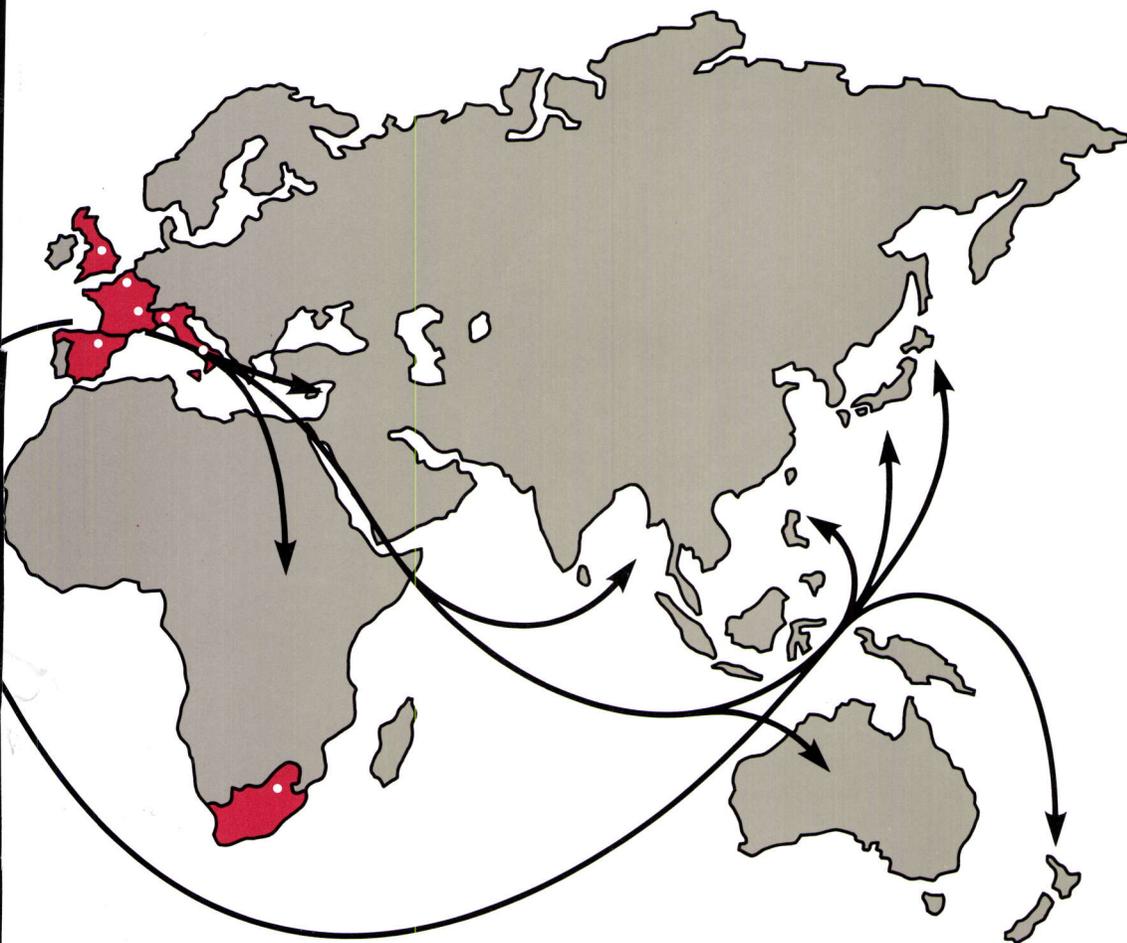
CARBON SPECIALTIES

The carbon specialties business manufactures carbon electrodes used to make silicon metal, elemental phosphorous, and ferro nickel. Refractory materials used to line furnaces in the steel and ferroalloy industries are also produced, as well as cathodes for aluminum production.

In 1989, customers produced more silicon metal. This helped our carbon electrode sales volume grow as we improved our market share. But

as customers relined a smaller number of furnaces, refractory sales declined. Cathode sales were unchanged. Prices of all products were stable, with gross margins declining slightly due to higher raw material costs.

We look for modest increases in carbon specialties sales in 1990. Carbon electrode sales traditionally follow the worldwide 3% growth rate for silicon metal. We will increase promotional and marketing efforts—first in Europe and then in other regions—to boost sales of refractory materials in 1990. Sales of cathodes will grow primarily in Brazil as that nation expands its aluminum production.



1989 Net Sales by Major Product

(Millions of dollars)



■ Graphite electrodes	\$588	(73%)
■ Graphite specialties	\$99	(12%)
■ Carbon specialties	\$84	(11%)
■ Flexible graphite	\$20	(3%)
■ Other	\$11	(1%)

1989 Sales by Geographic Area

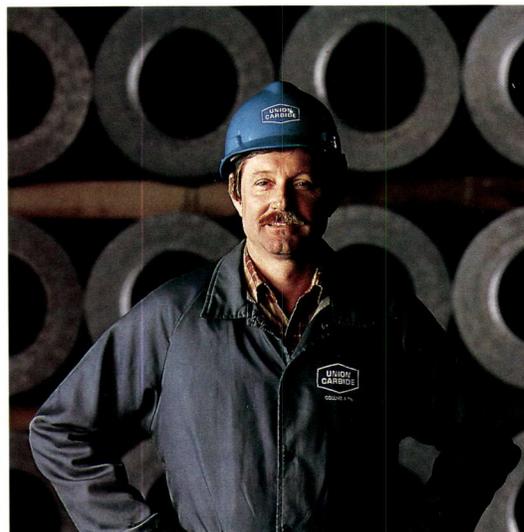
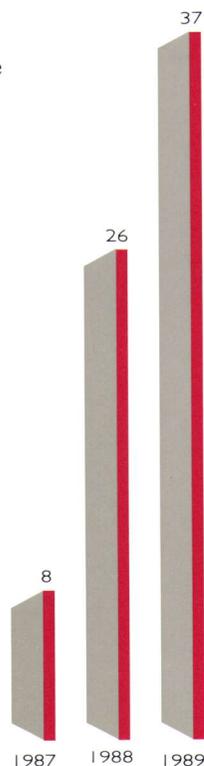
(Millions of dollars)



■ United States & Puerto Rico	\$365	(46%)
■ Europe	\$313	(39%)
■ Latin America, Far East & Other	\$72	(9%)
■ Canada	\$52	(6%)

Change in Sales Volume

(In percent)



Graphite electrodes
Carbon electrodes
Carbon refractories
Specialty graphite
Flexible graphite
Spray-cooled components

RAW MATERIALS AND MARKETS

We buy anthracite coal, premium-grade petroleum coke, coal-tar pitch, petroleum pitch and natural graphite flake to make electrodes, refractory linings, metallurgical specialties and other carbon and graphite forms. These are sold to the steel, ferroalloy, aluminum, chemical, aerospace and transportation industries. Electric power and natural gas or fuel oil are major operating costs.

The percentage of sales accounted for by the leading UCAR Carbon end markets is typically: steel—66%; non-ferrous metals—25%; chemical, electrochemical, aerospace—5%; transportation—4%.

FINANCIAL INDEX

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Dollar amounts in millions	1989	1988	1987
Sales	\$ 802	\$ 726	\$ 622
Operating profit	\$ 44	\$ 46	\$ 20
Net income	\$ 17	\$ 17	\$ 3
Number of employees (year-end)	6,024	6,482	5,843

SALES AND OPERATING PROFIT

Sales in 1989 increased 10% over 1988 to \$802 million, the highest level of the last three years. Increased shipments were recorded in the United States and most international areas, especially in Europe, where the largest part of our international activity occurs. Worldwide sales volume was higher for most major products.

Operating profit in 1989 was \$44 million, a decrease of 4% as compared with the prior year. The gross margin ratio increased to 21.3% from 20.9% in 1988. Increased volumes and a favorable effect from liquidation of LIFO inventory quantities acquired at lower costs prevailing in prior years were partially offset by increased manufacturing costs. Selling, administrative and other expenses increased 10%, reflecting increased selling costs due to higher sales and higher administrative costs. As a percentage of sales, however, selling, administrative and other expenses at 8.6%, were approximately the same as 1988. Other expenses—net in 1989 included a charge of \$4 million representing costs associated with restructuring a facility in Canada. Operating costs in 1990 are expected to benefit from the shutdown in January 1990 of a high-cost production facility in Puerto Rico and the restructuring of the Canadian facility.

In 1988, sales increased by 17% to \$726 million compared with the prior year. Increased shipments were recorded in all major geographic areas. Sales were helped by the effect of the weaker U.S. dollar on currency translation rates.

Operating profit in 1988 also increased over the prior year, reaching \$46 million. The gross margin ratio increased slightly to 20.9% from 20.4% in 1987 as a result of higher volumes and operating rates. More significantly, management's continued efforts at cost containment and profit improvement resulted in a reduction in selling, administrative and other expenses of \$11 million. The ratio of selling, administrative and other expenses to sales fell dramatically to 8.7% in 1988 from 11.9% in 1987.

Sales increased in 1987 to \$622 million, with increases reported in all of the segment's geographic areas. Increased graphite electrode volumes resulting from higher electric arc furnace steel production were offset in part by weak product pricing due to overcapacity.

In 1987 operating profit aggregated \$20 million. The relatively low gross margin ratio in 1987 of 20.4% was largely the result of a poor pricing environment. Also adversely affecting operating profit was an increase in selling, administrative and other expenses.

INTEREST EXPENSE

Interest expense for 1989, 1988 and 1987 was \$29 million, \$29 million and \$25 million, respectively, and includes allocated interest expense related to an assigned portion of Union Carbide's long- and short-term debt and debt equivalents. Debt has been assigned to the business based upon an analysis of its ability to cover fixed charges over the long term. This analysis considered both the level of business earnings and its volatility under different economic conditions.

INCOME TAXES

The effective income tax rates have been lower than the U.S. statutory rates during the last three years due to the substantial proportion of pre-tax income derived from non-U.S. sources.

MINORITY INTEREST AND EQUITY COMPANY EARNINGS

Minority interest decreased significantly in 1989 reflecting depressed results from our 52% owned Brazilian carbon products affiliate. In 1988, significantly improved results from both the Brazilian affiliate and the carbon products business of a 75% owned Canadian affiliate caused minority interest to increase substantially over 1987 levels. In December 1989, the Canadian carbon products business was purchased by UCAR Carbon in connection with Union Carbide Corporation's realignment program. Improved equity company earnings in both 1989 and 1988 are largely the result of improved results from the carbon products business of a Mexican affiliate.

NET INCOME

Net income in 1989 was \$17 million, the same as 1988. The reduction in 1989 operating profit was offset by a decrease in minority interest and an increase in equity company earnings. The relatively low net income in 1987 reflects low operating profit.

CASH FLOWS

Cash flow from operations of \$78 million compared with \$68 million in 1988. Cash flow used for investing is largely a function of capital expenditures, which totaled \$47 million in 1989 and \$44 million in 1988. The largest proportion of capital expenditures are applied to cost reduction and to expenditures for environmental, safety and health facilities. Approximately 60% of capital spending for the last two years was in international areas.

CONDENSED COMBINED
STATEMENT OF INCOME

Millions of dollars, year ended December 31,	1989	1988	1987
Net Sales*	\$802	\$726	\$622
Cost of sales	631	574	495
Research and development	5	5	8
Selling, administrative and other expenses	69	63	74
Depreciation	48	43	40
Other expenses (income)	5	(5)	(15)
Operating Profit	44	46	20
Interest expense	29	29	25
Income Before Provision for Income Taxes	15	17	(5)
Provision for income taxes	2	(1)	(11)
Income of Combined Entities	13	18	6
Less: Minority stockholders' share of income	3	7	5
Plus: UCAR Carbon share of income of corporate ventures carried at equity	7	6	2
Net Income	\$ 17	\$ 17	\$ 3

*Includes \$20 million sales to affiliates in 1989 (\$3 million in 1988 and 1987).

The Notes to Condensed Combined Financial Statements on page 15 should be read in conjunction with this statement.

CONDENSED COMBINED
BALANCE SHEET

Millions of dollars at December 31,	1989	1988
Assets		
Current assets	\$329	\$344
Net fixed assets	433	420
Investments, advances and other assets	53	50
Total Assets	\$815	\$814
Liabilities and Net Assets		
Short-term debt and current portion of long-term debt	\$ 55	\$ 38
Other current liabilities	129	130
Long-term debt	211	242
Deferred credits and other long-term obligations	50	48
Minority stockholders' equity in combined entities	50	65
Net assets	320	291
Total Liabilities and Net Assets	\$815	\$814

The Notes to Condensed Combined Financial Statements on page 15 should be read in conjunction with this statement.

CONDENSED COMBINED
STATEMENT OF CASH FLOWS

Increase (Decrease) in Cash and Cash Equivalents

Millions of dollars, year ended December 31.	1989	1988
Cash Flow from Operations	\$ 78	\$ 68
Cash Flow used for Investing	(59)	(45)
Cash Flow used for Financing	(15)	(22)
Effect of exchange rate changes on cash and cash equivalents	(4)	(1)
Change in cash and cash equivalents	—	—
Cash and cash equivalents beginning-of-year	1	1
Cash and cash equivalents end-of-year	\$ 1	\$ 1

The Notes to Condensed Combined Financial Statements below should be read in conjunction with this statement.

NOTES TO CONDENSED COMBINED
FINANCIAL STATEMENTS

1. BASIS OF PRESENTATION

These condensed combined financial statements reflect operations of the worldwide carbon products business, which include subsidiaries and 20% to 50% owned affiliates of Union Carbide (collectively referred to as UCAR Carbon). Except for the 20% to 50% owned affiliates, which are carried on an equity basis, the financial statements include the combined assets, liabilities, revenues and expenses of these operations. All significant intra-business accounts and transactions have been eliminated. UCAR Carbon was formed in 1989 as part of the realignment of Union Carbide Corporation from an operating company into a holding company.

The operations of UCAR Carbon include an allocation of Union Carbide's consolidated debt and interest expense related to an assigned portion of Union Carbide's debt and debt equivalents. The condensed combined statement of income includes allocations of expenses related to accounting, finance and administrative services provided by Union Carbide, which are included in *Selling, administrative and other expenses*. The provision for income taxes represents UCAR Carbon's allocated share of Union Carbide's consolidated domestic income tax provision and a provision for foreign income taxes. The cost of pension benefits for employees in the United States included in the condensed combined statement of income consists of an assigned portion of Union Carbide's pension expense for the U.S. Retirement Program and the cost of the separate plans maintained by international components.

2. OPERATIONS CARRIED AT EQUITY

The following are financial summaries of operations carried at equity:

Millions of dollars	1989	1988	1987
Net sales*	\$ 114	\$ 109	\$ 94
Net income	14	13	3
UCAR Carbon share	7	6	2
Total assets	\$ 138	\$ 131	\$ 153
Net assets	93	90	93
UCAR Carbon share	44	44	44

*Includes \$14 million net sales to affiliates in 1989 (\$12 million in 1988 and \$5 million in 1987).

DIRECTORS

ROBERT D. KENNEDY
Chairman

ROBERT P. KRASS

O. JULES ROMARY

**KEY MEMBERS OF THE WORLDWIDE
MANAGEMENT TEAM**

Robert P. Krass
President

Robert J. Hart
*Vice President and General Manager —
Graphite Specialties Worldwide*

James C. Howell
*Vice President and General Manager —
Graphite Electrodes, North America;
Carbon Products, Worldwide*

Giorgio Sferza
*Vice President and General Manager —
UCAR Carbon Europe S.A.*

Fred C. Wolf
Vice President — Finance and Strategic Projects

Peter B. Mancino
General Counsel

Reece G. Mitchell
*Director, Human Resources, Health/Safety/
Environmental Protection, Quality Systems*

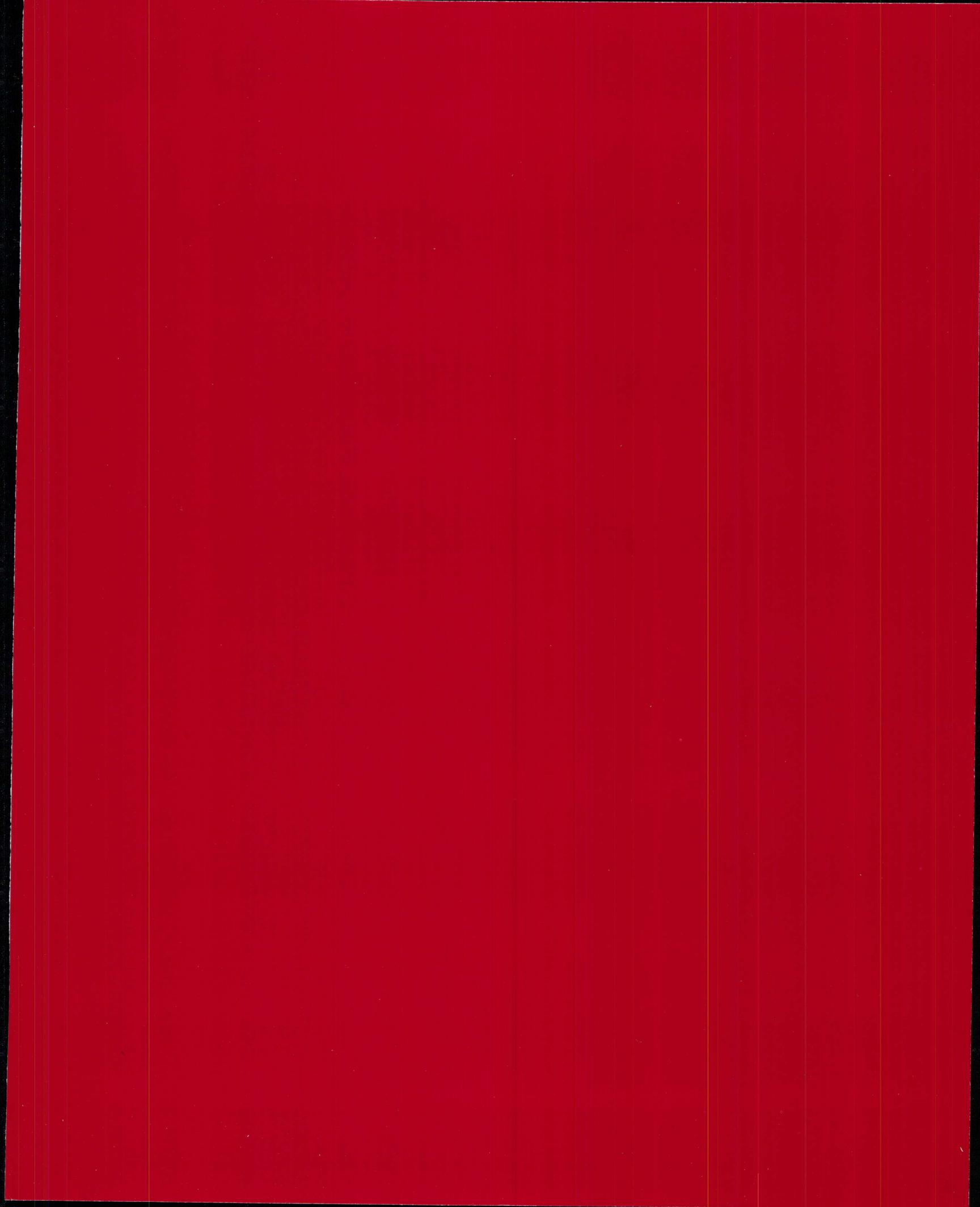
William P. Wiemels
Director, Technology

INFORMATION FOR INVESTORS

Audited combined financial statements for UCAR Carbon will be available in April of 1990. A copy may be obtained without charge by writing to the Secretary of Union Carbide Corporation, Section E-4, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001.



LEFT TO RIGHT, FRONT: MITCHELL; SECOND
ROW: HOWELL, MANCINO; THIRD ROW: HART,
WOLF, SFERZA; BACK : WIEMELS



UCAR CARBON
39 OLD RIDGEBURY ROAD
DANBURY, CT 06817-0001

This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0370006 Mine Name Rim-Columbus
Operator Denison mines (USA) Date February 28, 1990
TO _____ FROM _____

CONFIDENTIAL BOND CLOSURE LARGE MAPS EXPANDABLE
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UCAR Carbon

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